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Wulf A. Kaal
Kaal8634@stthomas.edu

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Decentralized Corporate Governance via Blockchain Technology

Wulf A. Kaal¹

¹*University of Saint Thomas School of Law, USA;
Kaal8634@stthomas.edu*

ABSTRACT

Corporations and other forms of business organizations can be supplemented with blockchain-based agency constructs. Blockchain-based decentralized autonomous organizations (DAOs) expand the definition of the firm. On-chain DAO governance enables dynamic regulatory features that facilitate unprecedented decentralized regulatory solutions.

Keywords: corporate governance; decentralized autonomous organization; blockchain; distributed ledger technology; regulation; protocols; optimization; efficiency; governance; dynamic regulation; principal-agent; emerging technology; agency cost; monitoring; feedback effects.

JEL codes: K20, K23, K32, L43, L5, O31, O32.

1

Introduction

Corporate governance is characterized by agency constructs. The agency relationship in modern finance and corporate governance is characterized by attempts to optimize incentives between principals and agents, control costs, minimize information asymmetries, control adverse selection and moral hazard, optimize risk preferences between principals and agents, and engage in monitoring. The Corporate form remains the most popular form of a governance mechanism, Despite the unresolved substantive agency problems associated with the division of ownership (shareholders) and control (agent),¹ and the incomplete and suboptimal rules that govern such conflicts.

¹Mark J. Roe, *The Inevitable Instability of American Corporate Governance*, in *RESTORING TRUST IN AMERICAN BUSINESS* 9 (American Academy of Arts and Sciences eds., 2004, MIT Press 2005). (“The core fissure in American corporate governance is the separation of ownership from control—distant and diffuse stockholders, with concentrated management—a separation that creates both great efficiencies and recurring breakdowns.”)

Shareholder value maximization has emerged as the dominant corporate governance solution for the agency problems.² To reduce the risk of managerial misbehavior and the associated agency problems,³ alignment of the interests of the stakeholders within those of the investor-shareholders has become the dominant implementation of the shareholder primacy doctrine.⁴ The doctrine suggests that by aligning the interests and incentives of the various actors with those of the investor-shareholders *all* of the stakeholders in a firm and the public benefit.⁵ Following this logic, increasing shareholder control over other actors within the firm has become the primary goal of corporate governance rules.⁶ The correct corporate governance is seen as naturally resulting in shareholder value.⁷

The existing corporate governance attempts for inevitable agency problems fall short of accomplishing the needed governance quality and stability. In an effort to curtail the inevitable instability that is a by-product of the pervasive agency problem in the corporate governance

²According to the dominant view, the goal of a firm should be to increase the financial interests of the investors and by doing so the firm can maximize opportunities to be successful. Stephen M. Bainbridge, *Director v. Shareholder Primacy in the Convergence Debate*, 16 TRANSNAT'L LAW. 45 (2002), available at <https://scholarlycommons.pacific.edu/globe/vol16/iss1/5>; Mike Marin, *The Crisis of Shareholder Primacy*, UNIVERSITY OF CAMBRIDGE: RESEARCH AT CAMBRIDGE (Mar. 19, 2012), <http://www.cam.ac.uk/research/discussion/the-crisis-of-shareholder-primacy>; H. Jeff Smith, *The Shareholders vs. Stakeholders Debate*, 44 MITSLOAN MGMT REV. no. 4, July 2003, at 85, <http://sloanreview.mit.edu/article/the-shareholders-vs-stakeholders-debate/>; Lynn A. Stout, *The Shareholder Value Myth*, (Cornell Law Faculty Publications, Paper No. 771, 2013), <http://scholarship.law.cornell.edu/cgi/viewcontent.cgi?article=2311&context=facpub>.

³Alessio M. Paccas, *RETHINKING CORPORATE GOVERNANCE: THE LAW AND ECONOMICS OF CONTROL POWERS* (2013).

⁴N. Craig Smith & David Ronnergard, *Shareholder Primacy, Corporate Social Responsibility, and the Role of Business Schools*, 134 J. BUS. ETHICS 463 (2016).

⁵Stout, *supra* note 2 (Discussing residual claimants arguments and potential benefits to society through the company); *see also* Smith, *supra* note 2.

⁶Justin Fox & Jay W. Lorsch, *What Good Are Shareholders*, HARV. BUS. REV. Jul.–Aug. 2012, at 48, <https://hbr.org/2012/07/what-good-are-shareholders>.

⁷*Id.*; Margaret M. Blair, *Shareholder Value, Corporate Governance, and Corporate Performance: A Post-Enron Reassessment of the Conventional Wisdom*, in *CORPORATE GOVERNANCE AND CAPITAL FLOWS IN A GLOBAL ECONOMY* 74, 53–82 (P. K. Cornelius & B. Kogut eds., Oxford University Press 2003).

system,⁸ governments have responded to corporate governance scandals by adopting a number of regulatory changes. Such changes include substantively increased disclosure requirements.⁹ Shareholder activism reform by itself has been unable to sufficiently improve the corporate governance system.¹⁰ Upgrading the U.S. proxy system has been another government priority.¹¹ Changes in executive compensation has been another approach to address the instability of the existing corporate governance system.¹² Government-sponsored organizational experimentation that enables new business models and new organizational

⁸Roe, *The Inevitable Instability of American Corporate Governance*, *supra* note 1.

⁹Benjamin E. Hermalin & Michael S. Weisbach, *Transparency and Corporate Governance* (Nat'l Bureau of Econ. Research, Working Paper No. w12875, 2007), <https://ssrn.com/abstract=958628>.

¹⁰Stephen M. Bainbridge, *Shareholder Activism and Institutional Investors* (UCLA Sch. of Law Pub. Law-Econ. Research, Working Paper No. 05-20, 2005), <https://ssrn.com/abstract=796227>; Jonathan M. Karpoff, *The Impact of Shareholder Activism on Target Companies: A Survey of Empirical Findings* (2001), <https://ssrn.com/abstract=885365> (“[T]he disagreement among researchers is more apparent than real. Most evidence indicates that shareholder activism can prompt small changes in target firms’ governance structures, but has negligible impacts on share values and earnings.”); Roberta Romano, *Less Is More: Making Shareholder Activism A Valued Mechanism Of Corporate Governance* (Yale Law & Econ., Research Paper No. 241; Yale ICF, Working Paper No. 00-10; Yale SOM, Working Paper No. ICF-00-10, 2000), <https://ssrn.com/abstract=218650> (“The finance literature presents an apparent paradox: Notwithstanding commentators’ generally positive assessment of the development of such shareholder activism, the empirical studies suggest that it has an insignificant effect on targeted firms’ performance. Very few find evidence of a positive impact, and some even find a significant negative stock price effect from activism.”); John C. Coffee Jr., *Liquidity Versus Control: The Institutional Investor as Corporate Monitor*, 91 COLUM. L. REV. 1277 (1991).

¹¹The existing U.S. proxy system lacks transparency; has few accountability mechanisms; is complex and costly; tolerates record-keeping inaccuracies partially because it provides no audit trail; and produces voting results that cannot be verified. John C. Wilcox, *Shareholder Nominations of Corporate Directors: Unintended Consequences and the Case for Reform of the U.S. Proxy System*, in *SHAREHOLDER ACCESS TO THE CORPORATE BALLOT* (Lucian Bebchuk, ed., 2004); Henry T. C. Hu & Bernard S. Black, *The New Vote Buying: Empty Voting and Hidden (Morphable) Ownership*, 79 S. CALIF. L. REV. 811, 811 (2006); David Yermack, *Shareholder Voting and Corporate Governance*, 2 ANN. REV. FIN. ECON. 103 (2010).

¹²Lucian A. Bebchuk & Jesse M. Fried, *Executive Compensation as an Agency Problem*, 17 J. ECON. PERSP. 71 (2003); Lucian A. Bebchuk *et al.*, *The Wages of Failure: Executive Compensation at Bear Stearns and Lehman 2000–2008*, 27 YALE J. ON REG. 257 (2010).

structures is desirable and valuable and may be one of the few ways to facilitate the much needed corporate governance reform.¹³

Despite decades of governance experiments and extensive rule revisions, the existing scope of agency problems suggest that the core underlying agency problems cannot fully be resolved within the existing theoretical and legal infrastructure.

Blockchain-based technology has started to offer alternatives to the existing corporate governance solutions. Blockchain technology can facilitate the removal of agents as intermediaries in corporate governance through code, peer-to-peer connectivity, crowds, and collaboration. Blockchain-based guarantees embedded in blockchain code can help ensure that no participant in business transactions and agency relationships can circumvent the set of governance rules. Blockchain guarantees include contract execution between principal and agent only if and when all contract parameters were fulfilled by both parties and verified in a consensus algorithm. Hence, in the blockchain infrastructure, a lower level of oversight and monitoring of agents changes the cost structure of the principal agent relationship.

Smart contracts enabled by blockchain technology allow for the comprehensive, near error free, and zero transaction/agency cost coordination of agency relationships. Smart contracts and smart property are blockchain enabled computer protocols that facilitate, verify, monitor, and enforce the negotiation and performance of a contract between principal and agent. Agency relationships in smart contracts run exactly as coded without any possibility of opportunistic behavior of the agent. All contractual terms are public and fully transparent. Accordingly, a company's finances, for instance, are visible on the blockchain to anyone, not just to the company's accounting department. Smart agency contracts run on a custom built blockchain, that enables principals and agents to store registries of debts or promises, create entire markets, among many other aspects that have not yet been considered.

Blockchain-cased legal constructs, known as decentralized autonomous organizations (DAOs), have started to challenge the core believe

¹³Bengt R. Holmström & Steven N. Kaplan, *The State of U.S. Corporate Governance: What's Right and What's Wrong?* (ECGI – Fin., Working Paper No. 23/2003, 2003), <https://ssrn.com/abstract=441100>.

that governance necessitates agency. The first DAO, launched in May 2016, in the founders' attempt to set up a corporate-type organization without using a conventional corporate structure, had a governance structure that was entirely built on software, code, and smart contracts that ran on the public decentralized blockchain platform Ethereum.¹⁴ Because it was pure computer code it had no physical address, no jurisdiction that could claim jurisdiction/control over it, and it was not an organization with a traditional corporate hierarchy. The DAO did not use a traditional corporate structure that necessitated formal authority and empowerment flowing top down from investors/shareholders through a board of directors to management and eventually staff. Indeed, it had no directors, managers or employees. In essence, all the core control mechanisms typically employed by principals in agency relationships were entirely removed in the DAO.

For purposes of this monograph, the DAO is a group of anonymized individuals who decide to follow a certain protocol. For instance, the Uber DAO can be seen as Uber the company with all its constituents except without the company, e.g., the entity, itself and its hierarchical governance structures. If Uber were a DAO, the Uber drivers as a group with their respective non-fungible token holdings would become Uber, e.g., a fully decentralized company without hierarchies. The control and power over the Uber DAO would be in the hands of the DAO Uber token holders. Yet, the staking mechanisms for non-fungible tokens in emerging DAO protocols make the voting structure different than any previous attempts at creating liquid democracies.

DAOs are by no means mainstream and are subject to a significant emerging development process. Because the blockchain industry is still in its infancy and core decentralized infrastructure elements will remain lacking for the foreseeable future, DAOs are less likely to disrupt existing corporate structures and the associated governance solutions in the foreseeable future. However, DAOs have the potential to create significant decentralized equivalents of corporate structures. Such development is contingent on workable governance solutions for

¹⁴Christoph Jentzsch, *Decentralized Autonomous Organization to Automate Governance* (unpublished manuscript).

DAOs. Without DAO governance, their evolution is even less certain. The blockchain industry has started to recognize the need for DAO infrastructure and governance solutions. Yet, such governance solutions are still largely lacking, even in the developmental phases.

Blockchain-based corporate governance solutions in DAOs require evolutionary blockchain governance protocols. Existing blockchain governance still mainly consist of forking a given chain. Even attempts to create socially optimal chain forking rules cannot suffice. Blockchain-based coded guarantees will evolve and require protocol upgrades for that changing environment. Without evolutionary governance upgrades the cost reduction for the agency relationship cannot be maintained.

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Conclusion

For the first time in history, blockchain technology gives actors and institutions the environment to collaborate on neutral territory. Every member's contributions to an institution can be recorded in a fully transparent way. These unprecedented technological features enable corporations and other forms of business organizations to be supplemented with blockchain-based agency constructs. As such, DAOs expand the definition of the firm, question the need for firms, and call into question the various versions of the theory of the firm. DAOs have started to challenge the dominant governance structures facilitated by legacy agency constructs. Future ideal-typical DAO governance designs will be filtered out at the edges of the system and will be subject to ongoing dynamic iterative change and upgrading. The technological infrastructure for DAOs enables these emerging features.